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How Blockchain Will Change Organizations

What if there were an internet of value — a secure platform, ledger, or database where buyers and sellers could store and exchange value without the need for traditional intermediaries? This is what blockchain technology will offer businesses.

Don Tapscott and Alex Tapscott • December 07, 2016

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For the last century, academics and business leaders have been shaping the practice of modern management. The main theories, tenets,

and behaviors have enabled managers to build corporations, which have largely been hierarchical, insular, and vertically integrated. However, we believe that the technology underlying digital currencies such as bitcoin — technology commonly known as blockchain — will have profound effects on the nature of companies: how they are funded and managed, how they create value, and how they perform basic functions such as marketing, accounting, and incentivizing people. In some cases, software will eliminate the need for many management functions.

Sound far-fetched? Let us explain. The internet vastly improved the flow of data within and between organizations, but the effect on how we do business has been more limited. That's because the internet was designed to move information — not value — from person to person. When you email a document, photograph, or audio file, for example, you aren't sending the original — you're sending a copy. Anyone can copy and change it. In many cases, it's legal and advantageous to share copies.

By contrast, if you want to expedite a business transaction, emailing money directly to someone is not an option — not only because copying money is illegal but also because you can't be 100% certain the recipient is the person he says he is. As a result, we use intermediaries to establish trust and maintain integrity. Banks, governments, and in some cases big technology companies have the ability to confirm

identities so that we can transfer assets; the intermediaries settle transactions and keep records.

For the most part, intermediaries do an adequate job, with some notable exceptions. One concern is that they use servers that are vulnerable to crashes, fraud, and hacks. Another is that they often charge fees — for example, to wire money overseas. They also monitor customer behavior and collect data, and they exclude the hundreds of millions of people who can't qualify for a bank account. And sometimes, they make terrible mistakes, as the 2008 financial crisis made evident.

What would happen if there were an internet of value where parties to a transaction could store and exchange value without the need for traditional intermediaries? In a nutshell, that's what blockchain technology offers. Value isn't saved in a file somewhere; it's represented by transactions recorded in a global spreadsheet or ledger, which leverages the resources of a large peer-to-peer network to verify and approve transactions. A blockchain has several advantages. First, it is *distributed*: It runs on computers provided by volunteers around the world, so there is no central database to hack. Second, it is *public*: Anyone can view it at any time because it resides on the network. And third, it is *encrypted*: It uses heavy-duty encryption to maintain security.

Blockchain transactions are continuously verified,

cleared, and stored by the network in digital blocks that are connected to preceding blocks, thereby creating a chain. Each block must refer to the preceding block to be valid. This structure permanently time-stamps and stores exchanges of value, preventing anyone from altering the ledger. To steal anything of value, a thief would have to rewrite its entire history on the blockchain. Collective self-interest ensures the blockchain's safety and reliability. Therefore, we think blockchain provides a powerful mechanism for blowing traditional and centralized models, such as that of the corporation, to bits.

The Role of Transaction Costs

In a classic article published in 1937 titled "The Nature of the Firm," economist Ronald H. Coase noted that there are costs associated with organizing production through the open market rather than through a firm — such as the cost of searching for relevant prices and the cost of negotiating numerous contracts. Coase expected businesses to expand internally until the cost of performing an additional transaction inside the organization become equal to the cost of using the open market. In a 1976 article, scholars Michael C. Jensen and William H. Meckling added another dimension by introducing the concept of "agency costs," which are the costs associated with managers'

tendencies to make decisions that are not optimal from an owner's point of view.

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Like many other analysts, we envisioned that the internet would reduce transaction costs so that corporate boundaries would become more porous and organizations would seek talent outside their boundaries. As it turned out, the costs fell much further than we expected and in turn lowered barriers to entry for startups and established businesses looking to expand into adjacent areas. To be sure, the

internet reduced the costs of search, while email, social media, cloud computing, and applications such as enterprise resource planning reduced the costs of coordination. More broadly, these new capabilities enabled corporations to outsource overhead, crowdsource innovation, and eliminate middle managers and other intermediaries, thus freeing industries such as accounting, commercial banking, and even music to consolidate assets and operations.

Managing With Blockchain

We believe that blockchain will transform how businesses are organized and managed. It allows companies to eliminate transaction costs and use resources on the outside as easily as resources on the inside. Vertical integration may continue to make sense in some situations (for manufacturing controlled pharmaceuticals, for example, or where companies have industry-leading strengths throughout the supply chain). But in most cases, we believe that networks based on blockchain will be better suited for creating products and services and for delivering value to stakeholders.

Human Resources and

Procurement

Blockchain will enable organizations requiring specialized talent and capabilities to obtain better information about potential contractors and partners than many traditional recruitment and procurement methods offer. With a prospective employee's consent, an employer will have access to a cache of information that's known to be correct because it has been uploaded, stored, and managed on a highly secure, distributable database. For example, job prospects wouldn't be able to lie about their training or degrees because an authority, such as the university they graduated from, has entered the data on the blockchain. Tampering with data after the fact wouldn't be possible: It would involve taking over the entire blockchain, a nearly impossible task. Individuals would control their own personal data (including birth date, citizenship, financials, and educational records) in a virtual black box. They alone would be able to decide what to do with the information.

Human resources and procurement staff will need to learn how to query the blockchain with specific yes or no questions — for example, Do you have this kind of license? Can you code in this specific language? The responses from all the black boxes will provide a list of people who meet these qualifications. Employers can ask whatever they want, and job seekers can program their black boxes with answers or refuse to answer.

Finance and Accounting

Information about a business's financial well-being changes all the time. When you search the web for a company's financial data, you search in two dimensions: horizontal (across the web) and vertical (within particular websites). What you find can be out-of-date or inaccurate in other ways. On a blockchain, though, there's a third dimension: sequence. In addition to being able to obtain a historical picture of the company since it was incorporated, you can see what has occurred in the last few minutes. The opportunity to search a company's complete record of value will have profound implications for transparency as it brings to light off-book transactions and hidden accounts. People responsible for records and reports will be able to create filters that allow stakeholders to find what they are searching for at the press of a button. Companies will be able to create transaction ticker tapes and dashboards, some for internal use and some for the public. As extreme as this may sound, it's really not.

Sales and Marketing

Just as a blockchain provides a way to obtain information about potential contractors and partners, it will be able to tell you about people or businesses who are potential customers. As we have noted,

individuals will control access to their own data in virtual black boxes, which will limit a company's ability to profile customers by tracking and capturing their behavior online. However, the blockchain will allow companies to engage with individual customers on a peer-to-peer basis.

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This may seem like a lot of effort, but it could actually be a huge opportunity. Some consumers may offer businesses access to their data in exchange for freebies; others will charge fees to license their data. Either way, companies will be able to reach their target audience with greater precision.

What's more, sellers won't have to worry about who

the customers are and whether they are able to pay. With the new platform, sellers won't have to incur the cost of establishing trust — thus they can facilitate transactions that would have been risky or might not have been possible otherwise. Furthermore, blockchains will eliminate the cost of warehousing data and protecting other people's data from security breaches. It should also be easier to target customers who make their interests known.

Despite the advantages of being able to reduce risk, there is also a downside. The ability to make precise queries leads to precise results. This means that there will be much less serendipity. With blockchains, you are less likely to discover people or partners who don't fit your profile but are open to change, willing to adapt, and eager to learn.

Legal Affairs

Coase and subsequent economic theorists have argued that corporations are vehicles for creating long-term contracts when short-term contracts require too much effort to negotiate and enforce. Blockchains facilitate contracting in both the short and long term. Through smart contracts — software that, in effect, mimics the logic of contracts with guaranteed execution, enforcement, and payments — companies will be able to automate the terms of agreement. A contract can refer to data fields

elsewhere on the blockchain (for example, a party's account balance, a change in a commodity price, or an additional sale of a copyrighted work). It can trigger alerts and ensure payments.

Because the contracts will be self-enforcing, corporations will not want to enter into them lightly. Changing the terms of deals (or attempting to manipulate them) will be more challenging. Lawyers and other managers will need to learn how to audit legal templates and make sure the contract software supports what both parties agreed to do. They will also need to become knowledgeable on issues involving the blockchain and smart contracts. The fastest-growing specialty in the law firm of the future is likely to be "smart contract mediator."

Raising Capital

We believe blockchains will also transform the process of raising money. In our view, the blockchain has the potential to disrupt the way the global financial system works and change the nature of investment. Mindful of this prospect, the New York Stock Exchange has invested in Coinbase Inc., a digital currency wallet and platform company headquartered in San Francisco, California. For its part, the Nasdaq Stock Market is also experimenting with blockchain technology.

Shareholders will be able to enforce the commitments executives make. Companies can specify relationships and state specific outcomes and goals so that everyone understands what the respective parties have signed up to do.

Integrating the Pieces

So how will blockchain help companies become stronger competitors? How can a company use it to integrate the various pieces? Blockchain technology provides a platform for people to work together with the persistence and stability of an organization but without the hierarchy. Consider ConsenSys Inc., a venture production studio based in Brooklyn, New York, that builds decentralized software applications and end-user tools that operate on blockchain. Founder Joseph Lubin describes the company's

structure as a hub-and-spoke arrangement rather than hierarchical; each project operates on its own, with the major contributors holding equity. For the most part, people get to choose what they work on. The central hub provides supporting services to the spokes in exchange for a share of the ownership. The various rights and relationships are codified in smart contracts that hold the entity together.

In recent years, we have been reminded all too often that managers don't always act with the highest degree of integrity. (Think of the scandals at Enron, AIG, and Volkswagen, for instance.) What if we could codify ethics and integrity into the circuitry of the enterprise, or reduce the moral hazard that too often sees management gambling with shareholder capital? Through smart contracts under blockchain, shareholders will be able to enforce the commitments executives make. Companies can specify relationships and state specific outcomes and goals so that everyone understands what the respective parties have signed up to do and whether those things are actually getting done.

On blockchain, executives will someday no longer need to attest that their books are in order once a year or every quarter; the blockchain will keep a company's books in order in what is, in effect, real time as a matter of course. Financial statements will go from snapshots of the enterprise at one point in time to a transparent, three-dimensional view of the whole

enterprise. Shareholders and regulatory agencies alike will be able to examine the books whenever they choose. Institutional investors will have the ability to create their own credit dashboards based on the facts, as opposed to relying on interpretations by ratings agencies. And ratings agencies themselves may overhaul their rating systems based on information from blockchains.

In contrast to the internet, which took two decades to develop and yet another decade to become commercial, the blockchain ecosystem is developing more rapidly as an economic platform. For executives, this means there is little time to waste. They will want to examine their industries and their competitors with an eye toward identifying opportunities for profitable growth.

Executives should begin by identifying people within the company who are interested in the technology or using digital currency. They should talk to people in the company's IT department about the technology's implications, buy some bitcoin, and experiment with purchasing inexpensive items on the blockchain to see how it works. At the same time, they should identify nearby companies using blockchain — take the opportunity to visit their operations and talk with people involved, and invite experts to meet with the team. Now is the time to reimagine how your company organizes the way it creates value. If you don't, someone else will.

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